



October 13, 2005  
Job No. 4417000641

County of Mono  
Minaret Mall, Suite P  
P.O. Box 347  
Mammoth Lakes, California 93546

**Attention: Mr. Gerry Le Francois, Planner**

**Re: Review Of "Addendum To Preliminary Hydrogeologic Investigation, White Mountain Estates-Phase 2, Chalfant Valley, Mono County, California", Prepared By Golden State Environmental, August 15, 2005.**

## **1 INTRODUCTION**

At the request of the County of Mono, AMEC Earth & Environmental, Inc. (AMEC) has reviewed the above referenced document. The focus of AMEC's review was to assess whether or not the content of the addendum report adequately addressed the potential impacts of the proposed development on the available water resources. The addendum report provides discussion and data regarding a second test well, White Mountain estates Well No. 2 (WME Well No. 2), recently installed on the site and presents responses to AMEC's comments regarding previous reports prepared by Golden State Environmental. The following paragraphs provide a summary of AMEC's assessment of the report and responses included in Attachment D.

## **2 WHITE MOUNTAIN ESTATES WELL NO. 2**

The addendum report presents information regarding the installation and testing of well WME Well No. 2. Well No. 2 is located on Lot 12 approximately 770 feet southwesterly and topographically down-gradient from the first test well WME Well No.1. The difference in elevation between WME No. 1 and 2 is approximately 60 feet. Well No. 2 is also approximately 1,000 feet southeasterly from the well that supplies the existing development within Tract 37-15 to the west. It appears that Well No. 2 was tested for a period of 24 hours at a pumping rate ranging from 170 to 200 gallons per minute. Apparently, the pumping rate could not be held constant due to declining water levels during the test period (over 82 feet of water level drop within the well). These data suggest a specific capacity of 2 gallons per minute per foot of drawdown. The assessed transmissivity values would indicate that a 100% efficient well would produce over 9 gallons per minute per foot. Thus the well is about 22% efficient. The resulting test data were analyzed using several methods along with assumptions regarding aquifer thickness and hydraulic state (degree of pressurization). The data do not appear to be corrected for inefficiencies of the well.

The issue of the test data and subsequent analysis aside, the addendum report fails to address whether the proposed development and the use of existing groundwater resources will have an adverse impact on the existing hydrogeologic conditions in the vicinity of the project as outlined in the California CEQA Guidelines, Appendix G Environmental Checklist Form, Section VIII.

Hydrology and Water Quality, subheading b. Substantial depletion of groundwater supplies is a critical issue that AMEC has expressed concern for in the past however; it has yet to be addressed. The use of existing on-site wells, such as WME Well No.1, as observation wells during relatively long-term pump testing could provide useful information regarding the potential adverse impacts to the existing springs and wells.

### **3 RESPONSE TO PREVIOUS COMMENTS**

Attachment D of the addendum report contains the responses of the projects hydrogeologic consult to previous AMEC review comments that remain unresolved. The items that remain unresolved include comments 3, 5, 9,10 and 13 as discussed in the AMEC letter dated July 8, 2005. AMEC's comments to the responses are as follows:

**Initial  
Comment  
No.**

**Discussion**

3 The project consultant has assumed the following:

- That there are habitable areas within proposed lots 45 and 46 that are situated topographically below and down gradient of the existing springs.
- That "Significant Fault No. 4" is an impermeably barrier that isolates groundwater up-slope from areas west of the fault.
- That wells west of the fault will draw groundwater from an area that is isolated from the springs and will have no affect on spring activity.

The existing faults may or may not be impermeably barriers. In any case the impact of proposed wells on spring activity due to the complex subsurface conditions is difficult if not imposable to predict. The concept that the proposed wells will be down gradient from the springs is in a general sense correct however, if the faults are impermeably barriers then the only gradients that are important are the local gradients that develop within discrete fault blocks as a result of groundwater withdrawals due to pumping from local wells. As such the ability of the proposed wells to provide an adequate resource is questionable. The pumping of test wells down gradient and west of "Significant Fault No. 4" is likely the only method available to determine the impact on spring activity and the availability of a sufficient groundwater resource of domestic use.

In addition, the possible impact of active fault displacements damaging the proposed wells and severely limiting their ability to provide adequate water supplies has not been fully considered.

**Initial  
Comment  
No.**

**Discussion**

- 5 The consultant's Response to Comment No. 5 is acknowledged. However, the question remains is there sufficient groundwater resource from WME Well No.1 and 2 for the proposed development? The project consultant has concluded that the three existing wells are screened within the "Valley Fill Aquifer". This assumption is made without the benefit of groundwater contour maps and geologic cross sections that could provide a demonstration of the continuity of the subsurface conditions observed in the existing wells. Additional long-term testing or modeling of the existing wells and known conditions could be helpful in determining the continuity of the subsurface hydrogeologic conditions and the possible adverse impacts to the groundwater system imposed by pumping of individual wells or the well field as a whole.
- 9 The consultant has concluded based on analysis of the pump test data that the Valley Fill Aquifer is best characterized as a "leaky aquifer model". This opinion is not supported by the boring logs for WME Well No.1 and 2.
- 10 The consultant's response to comment no. 10 is of concern since they acknowledge that there is insufficient recharge within the aquifer system to meet the long term annual demand for the project. However, it is stated that the addition of a second well will allow for the pumping of sufficient groundwater to meet this demand. Whereas, the intent of AMEC's comment has direct bearing on the sustainability of the system to support the proposed development considering existing conditions (local wells and springs). This issue is critical fulfilling the assessment of impacts as outlined in California CEQA Guidelines, Appendix G Environmental Checklist Form, Section VIII. Hydrology and Water Quality, subheading b.
- 13 The consultant has concluded that WME Well No.1 is capable of producing 120 gpm and WME Well No.2 is capable of producing 127 gpm for a combined flow of 247 gpm which exceeds the required flow of 114 gpm. The required flow of 114 gpm is equivalent to 184 acre feet per year which is 19 acre feet per year greater than the anticipated recharge to the groundwater system of 165 acre feet per year. Regardless of the number of wells utilized the required use of 184 acre feet per year will result in a yearly deficit 19 acre feet.

With respect to the three addition issues presented at the end of the AMEC review letter dated July 8, 2005, the only remaining unresolved item that appears to be critical to approval of the development as planned is item 3,. "Over utilization of the resource considering the combined use of water from the existing residential development, Tract 37-15 and Phases 1 and 2 of the Tentative Tract 37-46". The existing wells within Tract 37-15 and Tentative Tract 37-46 are situated in close proximity to the White Mountain Fault Zone which forms the easterly boundary of the Valley Fill Aquifer. The White Mountain Fault Zone represents a relatively impermeable subsurface barrier that at the very least restricts groundwater flow from the elevated terrain to

the east. Long-term pumping of the existing well field may, in time, deplete the groundwater resource within the portion of the aquifer between the wells and the fault barrier as potential recharge from up-slope areas is restricted by the fault. As the resource is depleted groundwater levels are expected to decline along with a corresponding decline in well production. For this line of reason, presentation of short-term pumping test data alone should not be used to characterize hydrogeologic conditions in areas of complex subsurface geology. Additional, defensible physical or empirical information is needed to support the conjecture that that impacts to the water resource will or will-not occur and that the long-term viability of the groundwater resource is maintained.

We understand that evaluation of the complex water resource issues of the proposed development has progressed slowly and it appears that some of the concerns raised by the County and AMEC in the past have not been addressed. We suggest that a direct dialog with the project proponents and their consultants would aid greatly in resolving the issues at hand.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Brett Whitford".

Brett Whitford  
Environmental Services Manager  
BW/MWM/dc

A handwritten signature in black ink, appearing to read "Mark W. McLarty".

Mark W. McLarty PG 3658, CEG 1107  
Associate Engineering Geologist

Encl.: None

c: Mr. Gerry LeFrancois, Addressee (1)